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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/604,630	08/06/2003	Guy M. Danner	H-356	1629
26245	7590	08/29/2006	EXAMINER	
DAVID J COLE			BODDIE, WILLIAM	
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733 CONCORD AVE			ART UNIT	PAPER NUMBER
CAMBRIDGE, MA 02138-1002			2629	

DATE MAILED: 08/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/604,630	DANNER ET AL.
	Examiner William Boddie	Art Unit 2629

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_\_.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-11 and 21-26 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_ is/are allowed.  
 6) Claim(s) 1-11 and 21-26 is/are rejected.  
 7) Claim(s) \_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|  | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

1. In an amendment dated, 3/29/06, the Applicant cancelled claims 12-20, amended claims 1 and 11, and added new claims 21-26. Currently claims 1-11 and 21-26 are pending.

### ***Election/Restrictions***

2. Applicant's election without traverse of claims 1-11 in the reply filed on 3/29/06 is acknowledged.

### ***Response to Arguments***

3. Applicant's arguments with respect to claims 1-11 and 21-26 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 1-4, 7-11 and 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Duthaler et al. (US 6,312,304) in view of Peterson et al. (US 4,882,454).

**With respect to claim 1,** Duthaler discloses, an electro-optic display comprising: a layer of reflective electro-optic material (18 in fig. 1) capable of changing its optical state on application of an electric field thereto (col. 3, lines 61-65);

an electrode arranged to apply an electric field to the layer of electro-optic material (24 in fig. 2);

a heat generating component in heat conducting relationship with the layer of electro-optic material (74 in fig. 6a/b), the heat generating component being disposed on the opposed side of the electrode from the layer of electro-optic material (seems clear from figs. 6a/b).

Duthaler does not explicitly disclose, a heat shield disposed between the heat generating component and the electrode, the heat shield comprising a layer of thermally insulating material and a layer of thermally conducting material, the layer of thermally conducting material being disposed between the layer of thermally insulating material and the layer of electro-optic material.

Peterson discloses, creating a printed circuit board / heat shield with layers of thermally conducting material (401 in fig. 5) and layers of thermally insulating material (402 in fig. 5; specifically note claim 1 of Peterson).

Duthaler and Peterson are analogous art because they directed to a similar problem area, namely manufacturing of printed circuit boards and subsequent packaging.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the circuit board of Duthaler (70 in fig. 6b) with the heat-shielded multi-layered circuit board of Peterson.

The motivation for doing so would have been to improve the heat dissipation from the circuit board (Peterson; col. 1, lines 14-25).

Therefore it would have been obvious to combine Peterson and Duthaler for the benefit of improved heat dissipation to obtain the invention as specified in claim 1.

**With respect to claim 2,** Peterson and Duthaler disclose, an electro-optic display according to claim 1 (see above).

Peterson further discloses, wherein the heat shield comprises a printed circuit board (figs. 1 and 2) having a conductive layer therein (401 in fig. 5).

**With respect to claim 3,** Peterson and Duthaler disclose, an electro-optic display according to claim 1 (see above).

Peterson further discloses, wherein the heat shield comprises a plurality of layers of thermally insulating material (402 in fig. 5) and a plurality of layers of thermally conducting material (401 in fig. 5), the layers of thermally insulating material alternating with the layers of thermally conducting material (clear from fig. 5), and one layer of thermally conducting material (outer layer of nickel, 403 in fig. 5; col. 4, lines 14-18) being disposed between the layers of thermally insulating material and the layer of electro-optic material (upon combining the two inventions this limitation would clearly be satisfied).

**With respect to claim 4,** Peterson and Duthaler disclose, an electro-optic display according to claim 1 (see above).

Duthaler further discloses, the circuit board (70 in fig. 6b) extending across the entire layer of electro-optic material (ovals in fig. 6b). Thus when replaced with Peterson's circuit board, thermally insulating and thermally conducting layers would extend across the entire layer of electro-optic material.

**With respect to claim 7,** Peterson and Duthaler disclose, an electro-optic display according to claim 1(see above).

Duthaler further discloses, wherein the electro-optic material comprises a rotating bichromal member material or an electrochromic material (col. 7, lines 8-45).

**With respect to claim 8,** Peterson and Duthaler disclose, an electro-optic display according to claim 1 (see above).

Duthaler further discloses, wherein the electro-optic material comprises an electrophoretic material (col. 7, lines 8-9).

**With respect to claim 9,** Peterson and Duthaler disclose, an electro-optic display according to claim 8 (see above).

Duthaler further discloses, wherein the electrophoretic material comprises at least one capsule having a capsule wall encapsulating a suspending fluid and a plurality of electrically charged particles suspended in the suspending fluid and capable of moving therethrough on application of an electric field to the electrophoretic material (col. 7, lines 8-45).

**With respect to claim 10,** Peterson and Duthaler disclose, an electro-optic display according to claim 8 (see above).

Duthaler further discloses, wherein the electrophoretic material comprises a substrate having a plurality of closed cells formed therein, each of the cells having therein a suspending fluid and a plurality of electrically charge particles suspended in the suspending fluid and capable of moving therethrough on application of an electric field to the electrophoretic material (col. 7, line 54 – col. 8, line 38).

**With respect to claim 11,** Duthaler discloses, an electro-optic display comprising: a layer of reflective electro-optic material (18 in fig. 1) capable of changing its optical state on application of an electric field thereto (col. 3, lines 61-65);

an electrode arranged to apply an electric field to the layer of electro-optic material (24 in fig. 3);

a heat generating component in heat conducting relationship with the layer of electro-optic material (74 in fig. 6a/b), the heat generating component being disposed on the opposed side of the electrode from the layer of electro-optic material (clear from figs. 6a/b).

Duthaler does not expressly disclose, a layer of thermally conducting material disposed between the heat generating component and the electrode.

Peterson discloses, creating a printed circuit board / heat shield with layers of thermally conducting material (401 in fig. 5) and layers of thermally insulating material (402 in fig. 5; specifically note claim 1 of Peterson).

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the circuit board of Duthaler (70 in fig. 6b) with the heat-shielded multi-layered circuit board of Peterson; thereby putting a layer of thermally insulating material between the electrode and the heat generating component.

The motivation for doing so would have been to improve the heat dissipation from the circuit board (Peterson; col. 1, lines 14-25).

Therefore it would have been obvious to combine Peterson and Duthaler for the benefit of improved heat dissipation to obtain the invention as specified in claim 11.

**With respect to claims 22-25,** Duthaler and Peterson disclose, an electro-optic display according to claim 11 (see above).

Furthermore as these claims are identical in their limitations to claims 7-10, these claims are rejected on the same merits shown above in the rejections of claims 7-10.

6. Claim 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Duthaler et al. (US 6,312,304) in view of Peterson et al. (US 4,882,454) and further in view of Leibowitz (US 4,812,792).

**With respect to claim 5,** Peterson and Duthaler disclose, an electro-optic display according to claim 1 (see above).

Peterson further discloses, wherein the heat shield comprises a polymeric film (col. 2, lines 32-39).

Neither Peterson nor Duthaler expressly disclose having a metal layer formed on the polymeric film.

Leibowitz discloses a metal layer (20 in fig. 2) being formed on a polymeric film (24 in fig. 2, also note col. 4, lines 53-55; also col. 4, lines 11-15 discloses that the two layers are joined).

Peterson, Duthaler, and Leibowitz are all analogous art because they are all directed to a similar problem solving area circuit board design.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the insulator/adhesive/conductor layers of Peterson with the polymer/metal layer of Leibowitz.

The motivation for doing would have been to remove the concern over the durability of the adhesive layer over time. With Leibowitz this concern is not an issue as the polymeric layer is coated with the metal.

Therefore it would have been obvious to combine Leibowitz with Peterson and Duthaler for the benefit of strengthened circuit boards to obtain the invention as specified in claim 5.

**With respect to claim 6,** Peterson, Duthaler, and Leibowitz disclose, an electro-optic display according to claim 5 (see above).

Leibowitz further discloses coating the polymeric layer with a conductive metal. While Leibowitz prefers copper (col. 4, lines 52-53), it would have been obvious to use aluminum instead as it is well known as a conductive metal.

The motivation for doing so would have been the decreased cost of aluminum over copper.

7. Claims 21 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Duthaler et al. (US 6,312,304) in view of Peterson et al. (US 4,882,454) and further in view of Kawada et al. (US 6,774,872).

**With respect to claims 21 and 26,** Peterson and Duthaler disclose, an electro-optic display according to claims 1 and 11 (see above).

Neither Peterson nor Duthaler expressly disclose, an air gap between the electrode and the layer of thermally conducting material.

Kawada discloses, a display device that constructs the placement of a printed circuit board (43 in fig. 10a) such that an air gap exists between the thermally conducting materials within the circuit board and the electrodes (12 in fig. 10a).

Kawada, Duthaler and Peterson are analogous art because they directed to a similar problem area, namely manufacturing of printed circuit boards and subsequent packaging.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include an air gap between the circuit board and display device of Duthaler and Peterson, as taught by Kawada.

The motivation for doing so would have been to further remove the display device from the heat generating components.

Therefore it would have been obvious combine Duthaler and Peterson with Kawada for the benefit of further isolating the heat generating components to obtain the invention as specified in claims 21 and 26.

### ***Conclusion***

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Will Boddie whose telephone number is (571) 272-0666. The examiner can normally be reached on Monday through Friday, 7:30 - 4:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AMR A. AWAD  
PRIMARY EXAMINER

Wlb  
8/24/06

